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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/423,981	02/18/2000	SHOGO MURAMATSU	991304	7398

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WASHINGTON, DC 20006

EXAMINER

SAVAGE, JASON L

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 02/26/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/423,981

Applicant(s)

MURAMATSU ET AL.

Examiner

Jason L. Savage

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 January 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4 and 6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

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***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-4 and 6 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

There is no basis for the newly added limitations in claims 1 or 2 that 'some of the granular Si particle having a particle size greater than 10  $\mu\text{m}$ '. Applicant's argument on page 4 of the amendment filed 1-02-03 has been noted, and while Figure 1 may or may not have sufficient basis for the limitation that the alloy have particles greater than 10  $\mu\text{m}$ , there is no disclosure or basis about the average (emphasis added) particle size of some (emphasis added) particles being greater than 10  $\mu\text{m}$ .

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori et al. (US 6,090,497) in view of Kawagoe et al. (US 5,864,745).

Mori teaches a coated member wherein the coating is a wear resistant Al-Si alloy having a content of Si from 26-80 weight % and further containing fine Si particles from 0.01 to 10  $\mu\text{m}$  dispersed therein (col. 2, ln. 27-37). The wear resistant coating may also contain additional materials such as 0.05-10%Mg, 0.5-10%Cu, 0.1-20% Sn, and between 0.05-15% of Mn, Fe, and/or Ni (col. 3, ln. 1-8; col. 3, ln. 65 – col. 4, ln. 9). Mori further teaches that the wear resistant coating which is formed by thermally spraying is suitable for compressor parts such as in automobiles (col. 5, ln. 44 – col. 6, ln. 3).

Regarding the limitation that the ratio of the short-diameter to long diameter Si particles is 1/3 or more, the particles in Figure 1 of Mori appear to fit well within the claimed ratio as most of the particles appear to be more rounded in shape.

Regarding the limitation that the alloy contain some particles having a size greater than 10  $\mu\text{m}$ , Mori teaches the particles in the comparative example are as large as 20  $\mu\text{m}$  (col. 9, ln. 24-25). Also, the teaching of Mori that particle sizes greater than 10  $\mu\text{m}$  are undesirable because it causes unfavorable acceleration of abrasion of a counter material (col. 4, ln. 20-22) shows that Mori has produced an alloy having some particles greater than 10  $\mu\text{m}$ . All the disclosures in a reference must be evaluated for what they fairly teach one of ordinary skill in the art even though

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the art teachings relied upon are phrased in terms of a non-preferred embodiment or even as being unsatisfactory for the intended purpose, *In re Boe*, 148 USPQ 507 (CCPA 1966); *In re Smith*, 65 USPQ 167 (CCPA 1945); *In re Nehrenberg*, 126 USPQ 383 (CCPA 1960); *In re Watanabe*, 137 USPQ 350 (CCPA 1963). Furthermore, the claim does not require that all of the particles are greater than 10  $\mu\text{m}$ , Applicant has failed to show how having a limited number of particles greater than 10  $\mu\text{m}$  in size would provide a patentable distinction over the prior art.

Regarding the limitation that the flame-spraying method used is HVOF, HVOF is a well known method of thermal-spraying. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used any known method of thermal-spraying, including HVOF to have applied the aluminum-alloy coating. Furthermore, the HVOF process does not provide a distinction over other flame-spraying methods since Applicant admits on page 5, lines 28-29 of the Specification that various flame-spraying methods can be employed to form the claimed aluminum-alloy. Finally, HVOF is a process limitation, when there is a substantially similar product, as in the applied prior art, the burden of proof is shifted to the applicant to establish that their product is patentably distinct not the examiner to show that same process of making, see *In re Brown*, 173 U.S.P.Q. 685, and *In re Fessmann*, 180 U.S.P.Q. 324.

Mori does not teach the roughening of the substrate surface; however, it is well known in the art to roughen the substrate surface in order to improve the adhesion of the overlying coating. Kawagoe teaches a flame sprayed aluminum silicon alloy (col. 13, ln. 5-7) as well as shot blasting the substrate to roughen the surface before applying the wear resistant coating (col. 15,

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ln. 59 – col. 6, ln. 31). It would have been obvious to one of ordinary skill in the art at the time of the invention to have roughened the surface of the substrate prior to applying the wear resistant coating of Mori in order to have increased the adhesion between the substrate and the coating.

Regarding the limitation that the flame-sprayed aluminum alloy has adhesive strength of film higher than that of a flame-sprayed Ni film, such an adhesive strength would have been inherent. The Patent and Trademark Office can require Applicant to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on Applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, *In re Best, Bolton, and Shaw*, 195 U.S.P.Q. 431 (CCPA 1977).

Regarding the material ranges in claim 3, although the weight percentages of the additional materials are not within the exact same ranges claimed by Applicant, all of the material ranges taught by Mori overlap the material ranges claimed by Applicant which obviates claim 3.

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5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mori et al. (US 6,090,497) in view of Kawagoe et al. (US 5,864,745) as applied to claims 1-4, and in further view of Wilkosz et al. (US 5,655,432).

Mori and Kawagoe teach what is set forth above but it does not teach a layer covering the outer surface of the wear resistant coating. However, it is known in the art to coat wear resistant components with lubricating coatings in order to improve the seizure resistance during dry conditions.

Wilkosz teaches an aluminum-silicon swash-plate compressor which has a coating comprising a PTFE resin and lubricating particles such as carbon and MoS<sub>2</sub> dispersed therein (col. 3, ln. 38-60). This coating reduces the friction of the swash-plate and increases its durability (col. 3, ln. 5-8).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have used the lubricating or friction reducing coatings of Wilkosz on the exterior surface of the coating taught by Mori as modified by Kawagoe in order to have improved the seizure resistance and to increase the durability of the swash-plate compressor, particularly during dry conditions.

#### ***Response to Arguments***

6. Applicant's arguments filed 1-02-03 have been fully considered but they are not persuasive.

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Applicant argues on page 5, the first full paragraph of the Amendment that Mori does not suggest that the compositions have an average particle size greater than 10  $\mu\text{m}$ . However, this argument is not commensurate in scope with the claims since the claims merely require that some (emphasis added) particles have this average size. Next, Mori clearly teaches an embodiment wherein some particles have an average particle size as large as 20  $\mu\text{m}$  (col. 9, ln. 24-25). Despite the fact that this embodiment is a comparative example that the invention actually teaches away from, the reference must be evaluated for what they fairly teach one of ordinary skill in the art. The teaching of average particle sizes as large as 20  $\mu\text{m}$  is clearly a teaching of the claimed invention. Furthermore, Applicant has not stated the amount of particles that is envisioned by the term 'some' nor has he defined the average particle size range of these larger particles other than stating they have an average size greater than 10  $\mu\text{m}$ . This limitation could be met by having as little as two particles having an average particle size of 10.0001  $\mu\text{m}$ . Absent a teaching or showing to the contrary, it is unclear how two particles having such an average particle size would provide a patentable distinction over the composition of Mori having particle sizes of 10  $\mu\text{m}$ .

Applicant further argues on page 5, the second full paragraph that anything disclosed in a comparative example is irrelevant as the composition of the comparative examples is not being applied in alleging that the claimed subject matter is unpatentable. As was stated in the rejection and above, all of the disclosures in a reference must be evaluated even though the art teachings relied upon are phrased in terms of being unsatisfactory for the intended purpose. This, despite



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Applicant's assertion to the contrary, the teaching in the comparative examples is quite relevant to the presently claimed subject matter.

Applicant further states that Mori's teaching that particles of this size are undesirable seems to weigh in the favor of the patentability of the subject claims. Merely pointing out the prior art sees such a particle size as being undesirable is not considered proof of patentability. Applicant has still not demonstrated how having some (emphasis added) particles having an average particle size greater than 10  $\mu\text{m}$  provides a distinction over the prior art composition, thus the patentability of the claimed invention has not been established.

Applicant argues in the paragraph bridging pages 5 and 6 of the amendment that the Examiner is merely speculating that such materials having an average particle size greater than 10  $\mu\text{m}$  had actually been made by the inventors of Mori. Mori clearly teaches a composition having particle sizes as large as 20  $\mu\text{m}$  in the comparative example, thus Applicant's assertion that such a material may not have actually been made is in error. Should Applicant still insist that Mori had never actually produced an alloy having the stated average particle size, he should submit proof showing why he believes this to be the case. The mere assertion that it may not have been produced is not considered proof.

Applicant states on page 6, the first full paragraph that the inclusion of relative coarse Si particles of more than 10  $\mu\text{m}$  contribute to enhance both wear resistance and seizure resistance with the materials according to the present invention. This argument is not commensurate in scope with the specification as the Examiner could not find any teaching in the Application that

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particles of this size have the stated effect on the material properties. Furthermore, the mere assertion that particles of this size have this effect is not considered proof. Applicant has not shown how a composition containing as little as two particles having an average size of as little as 10.0001  $\mu\text{m}$  would have enhanced properties compared to the composition of Mori having particles of 10.0000  $\mu\text{m}$ .

On page 6, the second full paragraph, Applicant argues that the present HVOF method produces a special morphology of Si particles which results in irregularly shaped particles which are distinct from the particles in the alloy of Mori. However, the claims are not directed to any specific HVOF process. Absent a teaching that all HVOF processes, regardless of the process parameters used, will result in the claimed morphology, the limitation that HVOF is used to form the alloy does not provide a patentable distinction over the prior art.

Applicant also argues on page 7, the second full paragraph, that the number of particles in a unit area in the case of HVOF is considerable smaller than that formed by plasma spraying. This argument is not commensurate in scope with the claim since no particles per unit area is claimed.

In the paragraph bridging pages 7 and 8, Applicant argues that the claimed invention differs from Mori in terms of structure and thus one or more properties and these differences produce unexpected or surprising results. First, it is still unclear how the claimed structure differs from the structure taught by Mori. However, even in the event that if there were some form of structural differences between the claimed invention and that of Mori, Applicant has

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failed to even name which property is affected, let alone what unexpected or surprising results are produced. Applicant has not met the burden of proof in any of his assertions that the claimed invention differs in structure, properties and/or results. Applicant next states that 'among others, the flame-sprayed aluminum alloy has adhesive strength of film higher than that of a flame-sprayed Ni film'. This argument appears to be completely unrelated to the present rejection since Mori clearly teaches a flames spray aluminum alloy and the claims of the present invention are drawn to a flame-sprayed aluminum-alloy. The comparison between an aluminum alloy and a Ni film is irrelevant.

On pages 8 and 9, Applicant argues that there is no suggestion for the combination of Mori and Kawagoe. As was stated in the rejection, it is well known in the art to roughen substrate surfaces in order to improve the adhesion of an overlying coating. Kawagoe is provided to show that the use of such a roughening technique in the art of forming a flame sprayed alloy coating is known. It would have been within the level of one of ordinary skill in the art to have recognized that it may be beneficial to employ such a roughening technique for flame sprayed coating taught by Mori in order to increase the adhesion between the substrate and the coating.

### ***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

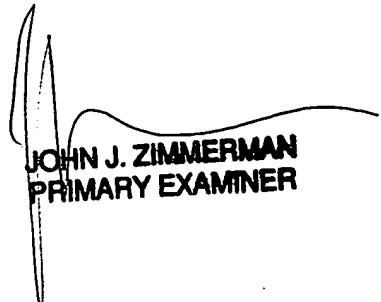
8. Any inquiry to this communication or earlier communications from the Examiner should be directed to Jason Savage, whose telephone number is (703)305-0549. The Examiner can normally be reached Monday to Friday from 6:30 AM to 4:00 PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Deborah Jones, can be reached on (703)308-3822.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703)308-2351.

  
Jason Savage

2-19-03

  
JOHN J. ZIMMERMAN  
PRIMARY EXAMINER